

EXPLOSIVES SAFETY

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FROM THE COMMANDING GENERAL OF THE U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND.

The mission of the U.S. Army Armament, Munitions and Chemical Command (AMCCOM) is to safely produce the weapons and ammunition for the U.S. Army (USA) and much of the ammunition of other services and this Nation's allies.

Many soldiers, sailors, marines, and airmen are exposed to the destructive forces designed into the ammunition and explosives in accomplishing their daily tasks. This is what makes explosives safety a necessary prime concern.

As the Commanding General of AMCCOM, one of my primary goals is to provide the highest quality, safest ammunition possible.

A guiding principle established in my command is to be responsive to you, our customers. To accomplish this there must be frequent, clear, and honest communications between you, the user, and my command, the producer.

Whenever explosives safety concerns arise involving the munitions that you must transport, store, demilitarize, dispose of, and use, feel free to contact the U.S. Army Technical Center for Explosives Safety (USATCES). In those areas where AMCCOM can assist the U.S. Army Executive Director for Explosives Safety (EDES) in addressing the concerns, we will. We must work as a team for we are interdependent in accomplishing the readiness required for our Army.

Solutions to explosives safety issues are oftentimes difficult and complex, but resolution can be found through communication and understanding of the concerns identified. This bulletin is one tool to begin to accomplish the necessary exchange of information.

I wish you success in your mission accomplishment.

PAUL L. GREENBERG
Major General, USA
Commanding

ACCIDENT/MALFUNCTION INVESTIGATIONS

The loss or destruction of valuable physical evidence is a recurring problem in the investigation of explosives accidents/malfunctions. Ammunition accidents/malfunctions can happen at any time during the life cycle of the item, but in any occurrence it is important not to disturb or destroy the evidence at the scene.

If you come home and find your house burglarized, ransacked, and strange symbols written on the walls in crayon, would you immediately begin to clean up the mess? Of course not, you would call the police to have them investigate. You would know enough not to touch anything until the police had completed their investigation. The same logic is true of an explosives accident/malfunction. You can consider that the detectives (the investigators) are on the way and you need to preserve the evidence for them.

The investigators are not out to blame the GI in the field, the production worker at the depot, or the truck driver on the highway. The investigator wants to find the cause of the accident. If the site is cleaned up and evidence trampled or destroyed, the search for the cause will, at least, be complicated and perhaps forever obscured. If the true cause is forever obscured, the same incident could repeat itself and injuries happen that could have been prevented.

by: Greg Heles
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AMMUNITION WITH DEPLETED URANIUM

A recent inquiry made of the U.S. Army Technical Center for Explosives Safety (USATCES) revealed that there may be difficulty in determining whether or not on ammunition item contains depleted uranium. For your information and future use, the nomenclature and national stock number (NSN) of all such items are listed in TB 43-0116, Identification of Radioactive Items in the Army.

by: Gregory A. Magerl
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QUANTITY DISTANCE (QD) REQUIREMENTS TO STORAGE TANKS

Several questions have been fielded by the U.S. Army Technical Center for Explosives Safety (USATCES) regarding the required distances between a potential explosion site (PES) and flammable liquid or gas storage tanks. The following are the minimum Army/Department of Defense (DOD) requirements:

a. Distance Required to Critical Aboveground Tanks/Pipelines. If an aboveground petroleum, oils and lubricants (POL); water; or compressed gas storage tank/pipeline is critical to the installation's mission, then it must be given inhabited building distance (IBD) protection, per AR 385-64, 22 May 1987, Ammunition and Explosives Safety Standards, table 9-1, column 5.

b. Distance Required to Underground Tanks/Pipelines. The formula to compute the required separation from Hazard Class/Division (HC/D) 1.1 munitions is $D = 3.0 W^{1/3}$, per AR 385-64, chapter 5, paragraph E-12. The minimum separation distance required from HC/D 1.1 through 1.4 is 80 feet.

c. Distance Required to Aboveground Tanks that Service Several Explosives Operating Lines or PESs. The tanks can be sited for HC/D 1.1 at IBD for blast only (disregard any associated fragment distance) and at no time will the distance be less than 400 feet. The minimum distance required for an exposure to HC/D 1.2 through 1.4 munitions is 400 feet, but additional distance should be used if available. Additional requirements for this situation are:

(1) Pipe systems that connect the PESs to the storage tanks must run underground.

(2) A dike system large enough to contain the spill of the entire contents of the tanks must surround the tanks.

(3) The major Army command (MACOM) accepts the possible loss of the tanks and any collateral damage that a fire might cause as a result of the tanks being punctured by fragments.

d. Tank in Support of a Single PES/Operating Line or Tanks with a Capacity of 500 Gallons or Less. Minimum fire protection distance is required when a single tank supports a single PES/operating line or when the tank has a capacity of 500 gallons or less. Generally, minimum fire protection distance will not be less than 50 feet and is detailed in the National Fire Protection Association (NFPA) Code 30.

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"Z" COMPATIBILITY STORAGE

Recently several inquiries were made about the relationship of Footnote 2 and Footnote 8 of figure 5-3, Storage Compatibility Mixing Chart, in TM 9-1300-206. There is some confusion about which compatibility groups can be stored together and what the storage limits are.

Footnote 2 means that only items which have a "Z" at the intersections of their compatibility groups can be stored together under certain conditions. Approval to store "Z" compatible items must be received from the MACOM. It is limited to operational necessity - as defined by the MACOM. It should be limited to items that would logically be used together; e.g., a fuze, projectile, and propelling charge. Each storage location; i.e., structure, pad, etc, limits are to be determined by the MACOM but not to exceed the storage location limits.

Footnote 8, which deals with incompatible storage, not just "Z" compatibility, means:

a. Storage compatibility groups A, K, and L cannot be stored with any other storage compatibility groups.

b. The total NEW of the items at one storage location, i.e., structure, pad, etc, cannot exceed 1,000 lbs.

c. Provided that rules "a" and "b" are met, all other storage compatibility groups can be stored together.

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PYROTECHNIC OPERATIONS STUDY

A team from the U.S. Army Technical Center for Explosives Safety (USATCES) visited the five Army installations that manufacture pyrotechnic items during fiscal years 89 and 90 to get a feel for the pyrotechnic production climate. These Government-controlled facilities were: Pine Bluff Arsenal (PBA), AR; Longhorn Army Ammunition Plant (LHAAP), TX; Lone Star Army Ammunition Plant (LSAAP), TX; Lake City Army Ammunition Plant (LCAAP), MO; and Crane Army Ammunition Activity (CAAA), IN. They also went to the U.S. Army Armament Research, Development and Engineering Center (ARDEC), NJ, and the Sverdrup Corporation, a testing facility, located at Stennis Space Center, LA.

The information gathered helps identify problems encountered in pyrotechnic items' production and creates awareness about equipment used to produce pyrotechnic compositions. It also helps evaluate personal protective equipment (PPE) and clothing to determine whether pyrotechnic operators have adequate protection from thermal and electrostatic hazards IAW DOD 6055.9-STD, Ammunition and Explosives Safety Standards, and DOD 4145.26-M, Contractor's Safety Manual for Ammunition and Explosives.

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THE OFFICE OF THE SCIENTIFIC ADVISOR

By 1996 there will be over 83.9 million pounds of large rocket motor (LRM) propellants in the demilitarization and disposal inventory in the United States, as a result of the management of the Intercontinental Ballistic Missiles (ICBM) normal life cycle support program and the proposed disarmament treaties. Presently there is no established, environmentally acceptable, cohesive disposal method for the LRMs. Long term storage of these big items can be unsafe as well as extremely expensive. Storage must be considered only a temporary solution to the ultimate disposition of the motors.

In 1989, the U.S. Senate Armed Services Committee requested that the Joint Ordnance Commanders Group (JOCG) Munitions Demilitarization and Disposal Subgroup initiate an LRM disposal program. The request came through the Office of the Secretary of Defense (OSD), the Joint Logistics Commanders (JLC), and the JOCG. Subsequently, a Joint Service LRM disposal ad hoc working group was organized; a LRM demilitarization technology review was conducted by the Scientific Advisor's Office, U.S. Army Technical Center for Explosives Safety (USATCES), in which 19 technologies were reviewed; a Joint Service research and development (R&D) program and investment plan for 9 technologies was identified; and 4 technologies were selected for the JLC endorsement.

The first LRM disposal technology Government/industry interface meeting was held at the U.S. Army Defense Ammunition Center and School (USADACS) on 10 August 1990. The Thiokol Corporation Strategic Operation and Aerojet Solid Propulsion presented discussions on their LRM disposal technology advances, R&D efforts, milestones, and costs.

Any questions regarding this program can be addressed to this office.

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NEW LIBRARY SERVICE

In September, the Technical Library added a new service to its computerized reference resources - the DIALOG Information Retrieval Service, one of the largest commercially-owned automated systems in the world.

The DIALOG system data bases, widely varying in content and structure, can be searched for subject coverage in science and engineering, defense and aerospace technology, energy and environment, law and government, chemistry, and other categories ranging from technical specialties to popular interests.

Most of the data bases in DIALOG contain bibliographic records of citations to original documents, and include authors, titles, abstracts, and special descriptive information, while other data bases contain the complete text of journal or newspaper articles. Many contain full listings of

directories, dictionaries, handbooks, and project descriptions, or records of numeric data.

All the data bases are maintained for currency, with update files from sources such as the National Technical Information Service (NTIS), Institute of Electrical Engineers (IEEE), Jane's Information Group, National Institute for Occupational Safety and Health (NIOSH), U.S. Environmental Protection Agency (EPA), and Dun's Marketing Services.

For more information about DIALOG services, contact the Technical Library.

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STATIC ELECTRICITY POSES POTENTIAL DANGER

For most people, static electricity is nothing more than a slightly painful inconvenience. For those who work with or near live ammunition, however, static electricity is a potential killer.

To scientists and technicians, a spark of static electricity is known as electrostatic discharge, or ESD. Many types of munitions and munition items are ESD-sensitive, posing danger to soldiers and ammunition workers.

Computers and associated equipment are especially sensitive to electrostatic discharge. Besides causing failures in electronic components, ESD can do hidden damage to circuitry.

Static electricity is an electric charge that accumulates on the surface of a material when two different materials come into contact and are separated, or when they are rubbed together.

By itself, this static charge is not a problem. If the charge is large enough, however, it discharges as a spark. This release of electrical energy can be dangerous and destructive.

Discharges of static electricity are more common in the fall and winter when the air is cold and dry. Under those conditions, materials lose their ability to dissipate static charges, which then accumulate to higher voltages.

The buildup of electrostatic charges can be prevented by providing a means of dissipating them as they are generated. This can be done by grounding and bonding ESD-sensitive equipment, grounding personnel, or by using static-dissipating materials.

The key to ESD safety is knowing what you work around and with during your daily operations. Find out how you can damage it or, worse yet, how it can kill or injure you. Learn how to prevent accidents caused by static electricity.

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The EXPLOSIVES SAFETY BULLETIN targets the ammunition/explosives community. It is printed in Savanna, Illinois.

If you wish to submit an article that is of interest to the ammunition/explosives community, or if you have a request for more copies of the bulletin, please forward it to: Director, U.S. Army Technical Center for Explosives Safety, ATTN: SMCAC-ES, Savanna, IL 61074-9639.

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